Botanical Gazette.

Vol. VIII. APRIL, 1883. No. 4.

Some North American Botanists.

IV. John Eatton LeConte.

Fifty years ago the writer of this notice was botanizing in the Pine barrens of New Jersey. While his quarters were in the little wayside inn at Quaker Bridge—then a kind of Mecca to which all good botanists were bound to make a pilgrimage—the entire loneliness of his sojourn was one day brightened by the arrival of a middle-aged man, of very pleasant demeanor, who came in a private vehicle from Philadelphia, and who, although then searching for certain insects, was at once seen to be an accomplished botanist. The writer had just found, at Atsion, a little below Quaker Bridge, the plant which we now call *Breweria Pickeringii*, and it was, with one possible exception, the first time it had been found in the Northern States and before it had been made known from North Carolina. The natural relationships of plants were not well understood in those days by youthful botanists; and the discoverer thought he had found a new Solanaceous plant; and was rather surprised when the gentleman told him that it was a *Convolvulus*. The gentleman was Major LeConte. During several succeeding years the writer, along with his master, Dr. Torrey, used to call in now and then and take tea with Major LeConte, at his house in New York. Mr. LeConte was a widower, with one son, an only child, then a lad, whose actual knowledge of natural history, and whose intense avidity for more, exceedingly interested and amused his older companions, and foreshadowed the entomologist who was to give new *eclat* to the name he inherited.

The following sketch, supplied to my hand, succinctly indicates the principal points in the genealogy and uneventful life of the subject of this notice.

John Eatton LeConte was born near Shrewsbury, New Jersey, February 22, 1784, and died in Philadelphia, November 21, 1860. His residence was partly in New York, where he was educated at Columbia College, partly in Georgia, where his father possessed a large tract of property in Liberty County. His family is of Huguenot descent, his ancestor, William, having left Normandy on the revocation of the Edict of Nantes to join the army of William, afterwards King of England. Thence coming to America he settled in New York, about the year 1692. His son, Peter Le-

Conte, was a highly esteemed physician in the lower part of New Jersey, and married Valeria, a daughter of John Eatton of Shrewsbury, among whose numerous descendants may be counted some of our most eminent citizens. From an early age his two sons, John LeConte and his brother Louis, showed a great love for Natural History and the observation of animals and plants. As young men they spent several years in Georgia, where they cultivated their father's plantation and occupied their leisure in the pursuit of science. Here it was that they established a botanical garden, mentioned frequently by the earlier travelers in the United States. This love of Nature and the observation of its phenomena has pervaded almost all the members of the LeConte family. About the year 1817, John LeConte entered the army of the United States as Captain of Topographical Engineers, and after serving ten years received the customary brevet as Major; but finding his health shattered by exposure during an exploration of the St. Johns River in Florida, undertaken in the line of his duty, he made a journey to Paris in 1827, where he formed the acquaintance of many of the most eminent men of science there, and with whom he subsequently kept up a correspondence. In 1832 or 1833 he resigned his commission in the army, and lived the retired life of an invalid in New York, until 1852, when he moved to Philadelphia.

His contributions to botanical and zoological science were published mostly in the Annals of the Lyceum of Natural History of New York, and in the Proceedings of the Academy of Natural Sciences of Philadelphia from 1852 to 1860. His extensive and valuable herbarium, which had been carefully reviewed by the older botanists of the country, was presented to the Academy of Natural Sciences of Philadelphia in 1852, and was followed shortly after his death by a large collection of fresh water mollusca of the United States, containing many original specimens of species first observed by him. He was a most untiring student and left much manuscript, the usefulness of which has been superseded by subsequent research, and likewise many thousand water-color drawings of insects of various orders, which his son has had mounted in albums suitable for inspection.

No separate botanical work bears his name as author, nor any in zoology that we know of, except one on American Lepidoptera, published in connection with M. Boisduval. But the Royal Society's Catalogue of Scientific papers records the title and place and date of publication of thirty-five of them, eleven of which are botanical. Several of these are monographs. The earliest, on the U. S. species of *Paspalum*, was published in the year 1820; three others, namely, those on *Utricularia*, *Gratiola*, and *Ruellia*, all in 1824; those on *Tillandsia* and on *Viola* in 1826; that on *Pancratium* in 1828. He was a keen but leisurely observer and investigator, and still more leisurely writer. He was a man of very refined

and winning manners, of scholarly habits and wide reading, of an inquiring and original turn of mind, the fruitfulness of which was subdued by chronic invalidism. When he went to Paris he took with him his herbarium, which for that time was unusually rich in plants of Lower Georgia and Florida; and we remember his remark that his botanical acquaintances there made very free use of his permission to help themselves to the duplicates. There is reason to think, accordingly, that the remains of it which went to the Philadelphia Academy of Natural Sciences will not throw all the light which might be expected upon the species of plants which were described in his published papers.

His old friends, Torrey and Wm. Cooper, named in his honor the genus which, as it proved, Rafinesque had some years earlier named *Peltandra*. And the opportunity was soon lost of commemorating his name in a plant of his own country: for Achille Richard in Paris, in 1829, bestowed the name of *Lecontia* upon a genus of Madagascar *Rubiaceæ*, now of five species. Although the name of John E. LeConte is best known to fame, it ought to be recorded that his brother, Louis, was also a keen botanist and excellent observer. The writer of this notice never knew him personally, for all but the earlier years of his life were passed upon the family plantation in Georgia. His name is mentioned in the perface as one of the contributors to Torrey & Gray's Flora of North America; and he deserved well of science in another respect, for he was the father of the two LeContes—President and Professor—of the University of California.—A. GRAY.

A New Walking-Fern.

(PLATE III.)

Although the variation of the common walking-fern (*Camptosorus rhizophyllus*) is very considerable, all the forms show a more or less auricled base. The auricles of the small forms are often so broad as to be nearly confluent with the stipe. On the other hand, I am informed by Mr. Davenport that in his herbarium are specimens with the base of the blade simply obtuse, the auricles having become quite obsolescent. But the latter is a rare occurrence, and appears to be the extreme of variation in the direction of a narrowed base. The interesting form of which an illustration is given herewith, has the striking peculiarity of an acute base without proper auricles. It was found and communicated by Mr. J. G. Haupt in Muscatine County, Iowa. It covered a few square yards, and was seen in but the one spot. The common form grew a few rods away, and by its luxuriance and large size gave prominence to the new kind.

The character of the base, together with some others, shows a considerable divergence from the typical form, and seems to indi-

cate an established variety, or at least a well marked form. Whether a good variety or not can better be told after the study of a larger number of specimens and from other localities. There is at least sufficient peculiarity to merit a careful description, and for the present, the rank of variety may be assumed.

CAMPTOSORUS RHIZOPHYLLUS, Link, var. INTERMEDIUS (n. v.). Rootstalk short, ascending, clothed with a few dark-brown scales; stipe green, with a brown base, containing a single rounded-triangular fibro-vascular bundle without accompanying sclerenchyma; fronds dimorphous, subcoriaceous, thinnish; sterile frond 2 to 4 inches long, triangular-acuminate, sometimes prolonged and rooting; base broadly wedge-shape; apex blunt; fertile frond 4 to 12 inches long, narrowly lanceolate, broadest close to the base, greatly attenuated and prolonged, rooting at the apex; base acute, broadly wedge-shape, never cordate; veins strongly ascending, anastomosing and forming about two series of areolæ; sori few, oblong, sometimes in pairs, or confluent at the upper part of the areolæ; indusium smooth, delicate, with a sinuous margin; spores ovoid, with broad anastomosing wings of irregular width. Sterile blade $\frac{1}{4}$ to $\frac{1}{2}$ inch broad near the base, fertile blade $\frac{1}{4}$ to $\frac{3}{4}$ inch broad.

Limestone cliffs in Eastern Iowa.

The features which distinguish this from the typical form are the single fibro-vascular bundle of the stipe without an anterior nation of sclerenchyma, thinner and narrower fronds, simpler vethread, acute base, shorter sori, and the greater differentiation of sterile and fertile fronds. Of these characters the most pronounced are the bundle of the stipe and the base of the blade.

It is a significant fact that the deviations from the type are all in the direction of the only other known species of the genus, *C. Sibiricus*, a native of northeastern Asia. So considerable is the approach toward that species that if our plant had been found in company with the foreign instead of the home sort, I doubt not it would have been set down as a genuine variety of the former. I have not, however, seen specimens of *C. Sibiricus*, and cannot speak with perfect confidence, but form my judgment from the extended and very complete description given in Milde's *Filices Eu. et Atlan.*, and the figure in Hooker's 2nd *Century of Ferns*. Professor Eaton writes me that a specimen in his herbarium corresponds closely with Hooker's illustration except it is not so large. The opinion of Linnæus that only one variable species of *Camptosorus* exists, may again find favor. At any rate the form under discussion is quite intermediate between the two established species. One character, however, yet to be mentioned, marks the closer affinity with *C. rhizophyllus*. It is the widening of the blade above the triangular base. By referring to the illustration, the slight lobation of the blade at the widest part is evident in every frond. These incipient lateral lobes are not auricles, but are of the nature of

the lateral prolongations occasionally produced by *C. rhizophyllus*, and well illustrated in Eaton's *Ferns of North America*. In *C. Sibiricus* both the auricles and the lateral developments are wanting, and the greatest breadth is still farther from the base of the blade. The character of the axial bundle is very marked, and should not be disregarded.—J. C. ARTHUR.

EXPLANATION OF PLATE III.—An entire plant of natural size showing four sterile fronds and a small fertile frond.

A single fertile frond of natural size with a plantlet growing from the apex.

Portion of the same frond enlarged six diameters, showing the venation and position of the sori.

Cross-section of a fertile stipe magnified thirty-five diameters, and drawn with camera lucida.

Notes on the Virginia Creeper.

A number of years ago I communicated to the *Academy of Natural Sciences of Philadelphia* the fact that every third node had one tendril, and that the leaves opposite the tendrils had no axillary buds. About the time of the publication of my remarks I twitted in pleasant vein the author of "*How plants Behave*," with inaccuracy, because the cut at p. 17 had an axillary bud opposite to a tendril. To my amazed discomfiture he replied by sending me a fresh specimen just like his drawing! It was a good lesson to me on the use of "never" by a botanist. I have since seen such cases, but very seldom. The rule is as I then noted. In the Japan species, *Ampelopsis tricuspidata* (*A. Veitchii* of gardens), the rule is the same. Mohr, a German writer on the grape vine notes that there are regular intermissions of tendrils in the grape vine, and Dr. Engelmann since, but I believe quite independently, observed the same, and at one time believed the fact might be made of value in the diagnosis of species. Much does not seem to have been made of it however in this direction. In the grape there is not the same constancy in the numerical order as in the Virginia Creeper. In *Vitis indicisa* I find a tendril at every node. In other species of *Vitis* and *Ampelopsis*, there are irregularities.

It is worth noting how *Ampelopsis quinquefolia* varies. In 1871 and '73 I collected it in the vicinity of Pike's Peak with narrow, laciniate, and somewhat glaucous leaves. Mr. Buckley notes it in Texas as often bearing seven leaflets, where it is his *A. heptophylla*. In Canada I find six leaflets common, with often the rudiments of a seventh. In the upper Delaware regions I have often gathered them with but three. In Pennsylvania the chief veins diverge and curve as they approach the margin. At Niagara I found them as nearly parallel and straight as in a horse chestnut. A first glance at one on Goat Island once, as it ran over a tree, gave me a pleasant surprise that I was looking at an *Æsculus*.

Some years ago a large *Ampelopsis* covered a *Cerasus serotina*

on my grounds. The cherry died, and in a few years the bark and wood rotted. Where this occurred the old stem of the Virginia Creeper commenced to send out rootlets. These rootlets seem to die annually, as they do in *Rhus radicans*. The main stem is a mass of rootlets. I have observed that the plant does this sometimes in the shade on stone walls, and at times when there is not so much shade. Perhaps some plants or some forms may have a greater tendency to root than others.

Another curious thing is that when the Virginia Creeper sends out these aerial rootlets, the wood has excentric circles, as the poison vine always has.

A matter which has interested me is the manner in which the branchlets disarticulate in the fall of the year. When a Virginia Creeper reaches the top of its support, it sends out weak laterals. In the fall these are all thrown off down to the lowermost bud. In other words the lateral branches increase only by the addition of one node a year. Remembering however the above cited tilt with the author of "*How plants Behave*" I must protect myself by remarking that though I say "these are all thrown off," I should not be surprised if some one were to show me a case where it is not so.

These observations have been recorded from time to time as made, in the Proceedings of the Philadelphia Academy. As recent attention has been drawn to the plant, it may be useful to present all in one chapter.—THOMAS MEEHAN.

Plants of Belle Isle, Michigan.

Detroit, the most beautiful city of the West, has the honor of possessing what will some day be one of the most delightful parks. It is the Belle Isle, situated a few miles up the river and connected by constantly going steamers with the wharves of the city. It is still in an almost primitive condition and certainly must be a treasure to the botanists of Detroit, affording a vegetation at once varied and quite free from the introductions that attend the progress of civilization. This is the locality from which Bigelow obtained his specimens.

A few steps from the landing at the island, *Lythrum alatum*, *Potentilla Anserina*, and *Lathyrus palustris* were growing abundantly. A few rods beyond the bath houses *Habenaria leucophaea* everywhere threw out its spikes of fringed flowers from among the grasses. *Rubus occidentalis* appeared, this time with an amber colored fruit, escaping the attention of groups of children busy in collecting the more common black variety. *Rosa setigera* was constantly in demand for the rural bouquets of excursionists, which seemed to have no definite size, but always had room for one more *Habenaria*, *Lysimachia stricta*, *Lobelia spicata*, or *Hypericum perforatum*. On the drier ground we saw *Geum strictum*, *Lobelia in-*

ifata, *Calamintha Clinopodium*, besides numerous ferns and other plants, which, however, have already been credited to this part of Michigan in Wheeler and Smith's catalogue. Near the water works, east of the city, *Zizania aquatica* grew among millions of *Wolffia Columbiana*, interspersed with *Lemna trisulca* and *L. polyrrhiza*, which the catalogue indicates as growing throughout Southern Michigan. *Sonchus oleraceus* was represented by a few stray individuals; also *Polygonum Pennsylvanicum* and *P. incarnatum*. Among the more common weeds may be mentioned *Cichorium Intybus* and *Atriplex patula*, var. *hastata*, both of which are found in unusual abundance throughout the city. Along the railroads *Œnothera biennis*, var. *muricata*, *Diplopappus umbellatus* and *Cenchrus tribuloides*, were well represented, the last plant very troublesome to the collector. A few other plants may be mentioned, which were found north of the city; *Solidago ulmifolia*, *Rudbeckia speciosa*, *Lactuca leucophæa*, *Spiranthes Romanzoviana*, *Botrychium ternatum*, var. *obliquum* and var. *dissectum*. The flowers of the *Spiranthes* wind in three ranks about the stem, but they are so arranged as to form 4 vertical rows in each spike. I also observed that young individuals were developed from the axils of the lower leaves, which I suppose furnish a means of propagation to the plant, it being well known that most orchids are slow to seed, requiring the agency of insects in securing fertilization. Proliferous specimens of *Scirpus atrovirens* were frequently seen in the fall.

Fungi were rather scarce. However, the species found were abundantly represented. Among these were *Scleroderma vulgare*, *Geaster triplex*, Jungh., *Bovista plumbea*, Pers., *Cyathus striatus*, Hoffm., *Boletus castaneus*, Bull., *Agaricus confluens*, Pers., and *Agaricus radicatus*, Bull.—Aug. F. Foerste, *Dayton, Ohio.*

Notulæ Californicæ.

The plant commonly known as German ivy (*Senecio mikanioides*, Otto) acts much as if it could become naturalized in California; though thus far one does not see it growing wild except along streams, and in places where its shoots may have found a lodgment after having been thrown away with the refuse of the gardens. But it is already of quite frequent occurrence in the ravines back of Oakland and Berkeley, where it flowers regularly and profusely shortly after Christmas.

Its dense masses of yellow bloom, upon the background of the dark foliage of live oak and bay over which it climbs, give a warm and cheerful look, at this season when flowers are few.

Owing to the climatic peculiarities of the past winter the common deciduous shrub, *Neillia opulifolia*, Benth. & Hook., will have shed its foliage twice in 1883. Its habit is, in this region, to put

them forth in the month of March, and mature and cast them off in September. But last autumn we were visited by very early and continuous rains, accompanied by warm weather; insomuch that this particular shrub in November unfolded its new leaves, and showed its flower buds. By the beginning of January, when the flowers had appeared, there came suddenly a very marked change in the temperature. The frosts killed the flowers; but the young leaves, barely full grown, seemed uninjured; but as late as February they turned red, and fell, as they are wont to do in autumn. Now, in the middle of March, they are appearing again, as boldly and vigorously as if nothing unusual had happened.

It is remarkable that no other of the ten or fifteen species of deciduous shrubs, inhabiting these same banks, were similarly affected by the season. *Ribes Menziesii*, Pursh, which is about the earliest to respond to the call of spring, and also the earliest to drop its foliage, remained wholly unmoved by the extraordinary vernal influences of last October and November, and is now in flower at its usual date; and the same is true of all the rest, with the single exception of *Symphoricarpus racemosus*, Michx. This shrub unfolded its leaves in November; but the subsequent frosts neither killed, nor yet matured them; their growth was only temporarily checked; and although it was for two months, they have lately attained their full size, and the shrub will flower at its usual time.

Of *Anthemis Cotula*, L., it is said in Bot. Cal. I. 401, that it is "sparingly found along roadsides: introduced, but not yet common." That was six or seven years ago; and now it is fairly abundant—too much so—whitening not only waysides, but waste grounds everywhere almost on the east side of San Francisco Bay. Moreover, like death, it has all seasons for its own, in California, for it may be found in flower every month in the year.

Although I have seen no specimens, I have it from two authorities which I deem wholly unquestionable, that the common foxglove (*Digitalis purpurea*) is not only thoroughly naturalized, but abundant far inland, in the country back of Humboldt Bay.

The most interesting waif which I have detected in the San Francisco region is a *Hemizonia*, one of the tarweeds, peculiar to this coast, which I found in a single specimen, on the Oakland pier in the summer of 1881. Being wholly distinct from all the species of its genus known to me, I made specimens, preserving every branch of the single, large plant; supposing, nevertheless, that it would prove to be some common species of the south part of the state, which had found its way hither by ship or rail. After keeping my specimens nearly two years, and having meanwhile collected and published half a dozen new ones of the same genus, I lately made a careful examination of this my neglected ballast waif, and found that it was also an undescribed species. I immediately

named it as new, and sent a branch to Dr. Gray, who writes back that it is his unpublished *H. Wrightii*, which he had obtained from San Bernardino through Mr. W. G. Wright, only a year earlier than the date of my collecting it as a waif five hundred miles from its home. The seed, from which my waif specimen was produced, came probably by rail: for it was at the terminus of the railroad route that I found the plant.—EDWARD LEE GREENE, *Berkeley, California.*

Botany at Harvard University.

The following brief notes, taken while spending the winter at the Botanic Gardens, will give the readers of the GAZETTE an idea of the nature and method of instruction given in this branch of Natural History at Harvard University.

Botany is one of the many *elective* studies which the whole course contains, so that all who begin it do not necessarily finish it. The course in elementary botany begins about October 1, and continues throughout the year. It consists, first, of practical exercises in analysis, by which means the student is made familiar with the process of determining plant names. This is done by analyzing, first some of the more common, regular, symmetrical flowers, and afterwards the irregular ones, such as some of the large *Compositæ*. Practical exercises are then given in the use of the analytical key, by which the student is made familiar with the process of tracing plants to their proper places in the Natural Orders. The next subject is to consider the different parts of the plants, following the plan given in Gray's Structural Botany.

Each student is required to work six hours a week in the laboratory, with a dissecting microscope. The last half of this course is devoted to the study of the Natural Orders and the useful plants which they contain, accompanied with the study of the most striking phenomena of vegetation.

At the beginning of the second year, the class take up the study of biology, pursuing a course rather more extensive than that given in Huxley's Elements of Biology: beginning with the lower Cryptogams, such as Bacteria, the different Moulds, etc.; passing to the higher forms, making a thorough study of the Ferns; finishing the first half with the study of Histology. During the second half year the class is given a thorugh course in experimental vegetable physiology, and systematic botany. In this course, besides the collection and identification of plants, each student is furnished with a compound microscope, and is required to spend at least six hours a week, during the last half year, in laboratory practice, in the examination of important orders, giving results of experiment with the different apparatus at his command. The

laboratory work in both the elementary and advanced classes is accompanied with lectures twice a week upon topics similar to the following:

Structure of, and useful plants in, Polypetalous, Monopetalous and Apetalous divisions.

Same in regard to Gymnosperms.

Morphology of Bracts, and an examination of inflorescence.

Morphology of calyx, corolla, stamens, carpels, ovules, seeds and fruits.

Movements in plants.

General laws of adaptation in the vegetable world.

Plants of former times.

Plants of extremes of climate.

Plants of the temperate zones.

General laws of plant distribution.

Relation of plant structure to functions.

Relation of plants to water; percentage of water in composition; root absorption; absorption by other parts; transpiration and its results; selection of dissolved salts and their appropriation by the plants.

Soil, its physical and chemical structure.

Relation of plants to the atmosphere; gaseous absorption; transfer of gases in plants.

Assimilation; structure of the leaf; chlorophyll, its properties; relation to light; products of assimilation; effects on the air; storing up of elaborated products.

Metastasis; changes which elaborated products undergo in the plant.

Production of active principles; relations of this to heat.

Respiration in plants.

Nitrogenous food; insectivorous plants.

Phenomena of growth.

Laws of growth.

Movements; autonomic; following shocks; associated with growth.

Buds and their transfer.

Fertilization in gymnosperms.

Fertilization in angiosperms; color, fragrance, etc., in flowers.

Fertilization; close, cross and hybridization.—J. TROOP.

Remarks on Dentaria as a Subgenus of Cardamine.

Bentham and Hooker in their "Genera Plantarum" have united *Dentaria* with *Cardamine*, arranging the species of the former as a subgenus under the latter. This, with our species, was done by Alphonso Wood in his "Botanist and Florist" in 1870, and he is credited with the names under *Cardamine*.

The only differences between the two genera, at least so far as

our species go, are in habit, the stems of the first being generally naked below and the second being leafy, and in the seeds of *Dentaria* being on broad, and of *Cardamine* on slender stalks.

The species of the eastern United States are in need of revision and the following is submitted to the consideration of botanists.

1. CARDAMINE DIPHYLLA, Wood. Rootstock long and continuous; toothed; stem leaves two.

2. CARDAMINE HETEROPHYLLA, Wood. Rootstock interrupted, forming a chain of two or three narrow oblong toothed tubers; stem leaves two to seven, mostly three, alternate.—The forms with more than three leaves are *Dentaria maxima*, Nutt.

This and the next species it would sometimes be hard to separate, for the next is sometimes found with two leaves, and sometimes with three and these alternate instead of whorled.

3. CARDAMINE LACINIATA, Wood. Rootstock same as last; leaves mostly three in a whorl, sometimes only two.

Var. MULTIFIDA, James. Leaves two or three, alternate or whorled, the leaflets with narrow linear lobes.

I do not think this form, called *Dentaria multifida*, Muhl., can be be separated with justice from the *laciniata*. In a recent trip to Lookout mountain, Chattanooga, I found both forms in full bloom, although not growing together, and some were so exactly intermediate in the division of the leaflets that it was hard to decide what they were. The rootstocks of both are alike. The variety however grows in poorer soil than the species itself, and we can thus account for the finer division of the leaves. To take the extreme form of the species and the variety and compare them, one would be inclined to give to each specific rank, but when we find them shading into one another as gradually as they do, we can see no other plan than to consider the *multifida* as a variety of *C. laciniata*.

The other species of *Dentaria* of the United States will now be *Cardamine Californica*, *C. macrocarpa*, and *C. tenella*.

I have specimens of var. *multifida* and many other specimens for exchange for my desiderata.—JOS. F. JAMES, *Custodian Cin. Soc. Nat. Hist., Cin., O.*

GENERAL NOTES.

Viola Beckwithii, T. & G., var. trinervata.—This pretty little violet was first collected near Goldendale, Wash. Terr., April 1, 1878, and at different times since, and has been distributed in my sets as *V. Beckwithii*, var. The characters of this new variety may eventually entitle it to specific rank, but for the present it is retained under *V. Beckwithii*. The principal characters are in the more simply pedate leaves, with broader lobes, having remarkable callous tips, and three prominent nerves, very strong in the mature leaves, the lateral pair submarginal, sometimes five nerves, when the outermost are strictly marginal.—THOS. HOWELL, *Arthur, Oregon.*

Solanum Fendleri.—This, one of the new Mexican tuberous species, was given to me many years ago by Dr. C. C. Parry. I found the tubers quite hardy here in Philadelphia, which of course the common potato is not. It came up among the hardy border flowers several years in succession, and finally disappeared, probably through ground mice. Some of the roots developed to the size of Black Walnuts before I lost them. It was on this experience only that I thought Mr. Lemmon's discoveries may be of advantage. I have not seen his plants, nor do I know what species he discovered in Arizona.—T. MEEHAN.

Sensitive Stigmas of Martynia.—In *Martynia proboscidea* the stigmas, when touched, close quickly, probably within ten seconds (I regret not having timed them), but if there is no pollen between the lobes these soon *reopen*, and this may be repeated several times during the life of the flower; but if there is pollen between the lobes they *never* reopen. If a bee enters one of these flowers, without having previously visited another, he closes the stigma without introducing pollen and it soon reopens. But if he has previously visited another flower and is covered with pollen, he introduces some of it between the lobes of the stigma, which then never reopens. This may have been observed before, but at all events I think it will be worthy of note as a remarkable adaptation for cross-fertilization.—EDGAR B. HARGER, *Oxford, Conn.*

The Arizona Potato.—I have been quite interested in Mr. Lemmon's discovery last July of *Solanum tuberosum* in the Huachuca Mountains, Arizona, in flower, and later in fruit.

Turning to my herbarium I find I have recorded on the label to my specimen, "*Solanum tuberosum*, L., var. *boreale*, Gray. Syn. Fl. p. 227. Mt. Graham, Arizona. Alt. 9250 feet." The specimens were taken in August 1874 and were beyond doubt indigenous. They were in flower but some had tubers about three-fourths of an inch in diameter.

This variety Gray recognizes as his old *Solanum Fendleri*, and states distinctly that it is not specifically distinct from the potato plant.

There can be no question that henceforth we must regard the potato as an indigenous plant, in the mountains of our Southwest.—J. T. ROTHROCK.

Dr. Torrey.—I was employed by Dr. Torrey, during the last year of his life, in some small botanical details of his herbarium, and then I had an opportunity of noting his marvelous skill in mechanical resources. It impressed me the more, perhaps, as nature has not endowed me in this way. During my sojourn at Columbia College, I saw the dear old man in the most intimate way, and loved him as did all his associates. Often returning to my room late at night, I have found the Doctor hard at work in the herbarium, all the windows shut down in the August heat, and he himself in his shirt sleeves. He preferred to suffer rather have his plants disarranged by the wind. Pointing to the well-loaded shelves of his priceless herbarium, he once said to me with his quaint, child-like manner, "That represents a deal of back-ache." I have since learned to appreciate the remark.—W. W. BAILEY.

Stamens of Heteranthera reniformis.—Mr. Fritz Mueller writes to *Nature* describing dimorphism exhibited by the stamens of *Heteranthera reniformis* and commenting on the probable benefit of such dimorphism. He says; "In *Heteranthera reniformis* there is one long stamen (belonging to the outer whorl) having pale bluish pollen, and two short stamens (of the inner whorl) with bright yellow pollen. The stigma stands generally on a level with the anther of the long stamen. When the white flower opens, the pistil and long stamen diverge, the pistil bending (almost without exception) to the right, and the stamen to the left; at the withering of the flower, they again approach each other, so that the stigma may be fertilized by the pollen of the long stamen. Visiting insects are attracted yet more to the yellow anthers of the two short stamens by their being placed close to a yellow spot, surrounded by a violet border, at the base of the upper petal. * * * * Fertilization is almost exclusively effected by the pollen of the longer stamens, while the shorter stamens serve only to attract pollen-gathering or pollen-eating insects. * * * The dull color of the long stamens serves to make them less visible to insects."

A New Puff-Ball.—In a recent number *Grevillea*, Dr. M. C. Cooke prints the description of a new puff-ball, from Ohio, which is of exceeding interest. It belongs to a long lost genus, described by Klotsch in "Linnæa" some fifty years ago and a puzzle to mycologists ever since. The following is the description:

CYCLODERMA OHIENSIS, *Cke. & Morg.*

Subglobosum, album, læve. Peridium glabrum, coriaceum, superne umbonatum, inferne radicoso-fibrosum. Columella subcylindrica, æqualis, capillitioque radiante alba. Sporis minutissimis, globosis hyalinis.

On the ground. Ohio, U. S.

About an inch in diameter, or less, columella two-thirds the height of the peridium, wholly white within.

The double peridium is very distinct, especially as the individual advances in age. The outer peridium is composed of rather coarse, irregular, contorted fibres, closely interwoven. The capillitium is an exceedingly delicate membrane, much folded and plicate. The spores are globose, hyaline, and very minute.

Some Popular Botany.—A writer who affects the style of Thoreau, gives us, in the March number of the *Century Magazine*, some curious notes on the habits of evergreen and deciduous trees. He takes occasion to say that "most persons are unreliable observers," a statement somewhat lacking in originality, but which connot be gainsayed. "People live in the country all their lives without making one accurate observation *about* nature." (May I suggest in extenuation that "observations about nature" at so much per page in a popular magazine pay better

than that modest, reticent study *of* nature in which many country people nevertheless indulge.)

"The evergreen trees in front of their doors, what do they know about their habits? Do the pine and hemlock shed their leaves? Not in any strict sense." May I ask in a vague sense what they do with them otherwise? "In the deciduous trees the new leaves *take the place of the old* (sic), *they come out in the axils of the old leaves* and the branch is reclothed each spring, even if no new shoots appear"!! Dr. Gray says that whatever is produced in the axil of a leaf when developed is a branch—but then Dr. Gray may be one of those unfortunates who miss their fact for lack of "a sharp eye" and capacity for "swift inference." "But none of the Coniferæ renew their leaves as do the deciduous trees." "If the tree (conifer) were to cease to grow it would probably (though of this I am not certain) cease to shed its leaves." Nothing like caution in stating a scientific hypothesis, but what sense is there in the foregoing? It may be said that a writer who uses language in such a loose way as to talk about the "molting season" of trees and "foresight in a weed" is not to be held to a close verbal construction. But the context of the passage from which I have quoted shows an effort toward hypercritical accuracy on the part of one who "holds his eye long and firmly to the point and will not be baffled."—A. COUNTRYMAN.

Water Pores of Fuchsia.—In Bessey's Botany (1st Ed., p. 104) Mr J. C. Arthur figures a water pore from a leaf-tooth of *Fuchsia globosa* and mentions the fact that in the dark colored varieties there are several of these openings on each tooth. The accompanying figure illustrates a group of these as shown by a slide prepared by Miss Katie L. Bishop in the botanical laboratory of Purdue University. The number of these water-rifts is unusually large, seven surrounding *a*, the central pore, which commonly occupies alone the tip of the tooth. Several slides were obtained, showing two or three of these openings, but none approaching the number here figured. Inasmuch as the literature and illustrations concerning this subject are so very meager it is hoped that this figure, though not representing any great novelty, may be of use to whoever undertakes a fuller study of these interesting structures.—C. R. B.

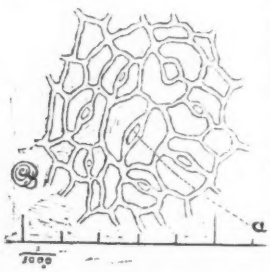


Fig. 1.—Water-pores from tip of tooth on leaf of *Fuchsia* (sp.?). *a*, central pore.

Schedule for the study of Cyperus.—I have found the schedule plan of approach so useful with difficult orders and genera that I constantly extend it to the examination of others. The young student is apt to see in a sedge or grass so much at once that is new and confusing that he may abandon the work in despair. If, however, he carefully writes

out the account of one thing at a time, he eliminates the element of doubt, as well as the too natural desire to compel the plant into some corner where his preconception supposes it to belong. Morever, by this plan, he actually studies the plant and bears away an idea of its structure and affinities, rather than a mere name. I have found the accompanying schedule for the genus *Cyperus* so useful in practice that I am induced to communicate it for the benefit of other teachers of our science.

SCHEDULE FOR CYPERUS.

The Roots. Note their character as indicative of the duration of the plant.

The Rootstocks. Note if present and whether tuberous.

The Culms. Describe as to section, height, surface and color. Are they slender or stout?

The Leaves. Describe in ordinary terms of the leaf.

The Involucre. Of how many leaves is it formed? Describe these and state their length as well as the number and length of those of

The Involucels.

The Spikes. Are they in simple or compound umbels? Are they flat or terete? Give their general shape. Are they many or few-flowered? Are they appressed, spreading, or reflexed? State their color. Is the axis winged or naked?

The Scales. Describe their shape, margin, and apex. Note if they are empty. Are they keeled or not? Are they appressed or spreading? Are they nerved or not? Are they deciduous or persistent?

The Stamens. Give their number.

The Styles. How many times are they cleft?

The Achenium. Is it lenticular or triangular? Describe its general shape, and tell whether or not it is pointed.

The above is introduced by a general talk about the genus, with illustrations and diagrams. It has been put to the test of laboratory practice and stands the ordeal well.—W. W. BAILEY, *Brown Univ., Providence, R. I.*

Anthesis of Cyclamen.—I have been much interested in watching in my window garden the anthesis of this beautiful plant. At first it consisted of nothing but a thick cluster of heart-shaped or almost reniform radical leaves rising from a half buried corm, which, we are told, has been developed even in the seed. Hidden among the leaves could be found numerous nodding flower buds, giving but little promise of their future beauty. For several weeks the plant seemed to be engaged in storing energy, no surface change appearing. Suddenly the one-flowered peduncles began to elongate and grew with wonderful rapidity, carrying the buds far above the leaf cluster, until a length of 8 or 10 inches had been attained. In some cases all this growth was accomplished in

24 or 48 hours, the stem increasing in diameter as well as in length; in other cases it took longer. No finer example of rapidly dividing cells can be obtained anywhere than is furnished by these elongating peduncles. Then comes another resting period, after which the convolute petals begin to elongate, gaining nearly their full length while still rolled together. Presently a loosening up is noticed near the middle of the roll of petals, the edges beginning to free themselves from any overlapping and thus giving elbow room for the next movement. As is very well known the petals are strongly reflexed, just as in *Dodecatheon*, and I was somewhat curious to see how the reflexing took place. Closely as I watched, several buds opened without my catching a glimpse of the manner; but finally I was rewarded by seeing the reflexed position gained in a variety of ways. The usual way seems to be for the two upper petals to fly back suddenly like liberated springs, and the remaining three to come back slowly one at a time, with an almost imperceptible movement, always in the same order, the innermost petal being last. Sometimes, however, all five spring back at once, spreading out like the rays of a star, and then usually the two upper ones become at once completely reflexed, leaving the other three to assume the position gradually. There seems thus to be a combination of a simple mechanical movement, the sudden springing from a confined position, and a vital movement which brings the released petals slowly back to the required position. Mr. Darwin[1] has spoken of the movement of the peduncles in bending downward and burying the pods and this movement was beautifully shown in the specimens examined, and the circumnutation was also very noticeable. Circumnutation in the slow movement of the reflexing petals is very evident, as they describe quite a sensible arc before settling into their permanent positions and even then continue it and become quite twisted. This might partly be due to their having been in the convolute arrangement in the bud, but this cannot entirely account for it, and may not this very convolute arrangement look to circumnutation at least as an abettor, and the tension which causes the upper petals to spring back when released be stored up by its restraint? So then this same *Cyclamen Persicum*, which yielded to Darwin illustrations of movement in cotyledon, peduncle, and leaf, continues the story in the petals.

It might be interesting in this connection to note the presence of cleistogamous flowers. In some the peduncles never elongated, but in one it grew as rankly as those of other flowers, and one stunted petal crept out of the calyx-tube, but that was all. The stamens though were full to bursting of pollen, which does not look like cleistogamy, and the pod was the best formed of all and full of seed. It would seem as if all the cleistogamous flowers should have elongated peduncles if the habit of burying the pods is to be preserved.—J. M. C.

[1]Power of movement in Plants, p. 433.

EDITORIAL NOTES.

MR. W. C. WERNER, of Painesville, Ohio, found, in 1881, specimens of *Lactuca Scariola*, L., along the L. S. & M. S. R. R., where it has settled down to stay.

FASCICLES X AND XI of Ellis' Fungi of North America will be issued soon. Fascicle XI is to be devoted to *Uredineæ*, and promises to be very interesting.

DR. H. CHRIST, Rue de l'Arbre, 5, Basel, Switzerland, is engaged upon a revision of the European Carices and desires to procure by exchange or purchase American specimens for comparison.

PROFESSOR BURRILL names the bacteria causing the blight of pear trees, the poison of poison ivy, and the epidemic disease of chinch bugs, respectively *Micrococcus amylovorus*, *M. toxicatus*, and *M. insectorum*.

H. PICK FINDS that the palisade tissue of the upper surface of leaves grown in the shade has shorter cells than that of similar leaves grown in the sunlight. In some cases the palisade cells were round or even elongated parallel to the surface.

DR. GEO. M. STERNBERG, of the U. S. Yellow Fever Commission, is preparing a work on Photomicrographs and how to make them, which will supply much needed information to those who desire to use this valuable method of illustrating what the microscope reveals.

DR. GOODALE has imported from Germany a number of pieces of very valuable apparatus for investigations in physiological botany at the Harvard botanical laboratory. It is the only collection of the kind in this country, and on account of its expensiveness will doubtless be so for some time.

MR. THOS. MEEHAN in observing *Stapelia bufonia* discovered that the axillary buds, in the normal condition of the plant, produce branches only, the flowers coming only from the weaker lateral accessory buds. But when the vegetative power of the plant is weakened, as by drying out, the axillary buds become the flowering ones,

MR. H. N. PATTERSON, of Oquawka, Ill., has ready for delivery his first box of North American genus labels, from *Ranunculaceæ* to *Compositæ*, 650 genera, 3 of each. We have never seen anything more neat and convenient and would most heartily recommend them to botanists as just the thing to paste upon their genus covers. The set mentioned above costs $1.30.

THE BULLETIN OF THE BUFFALO NATURALISTS' FIELD CLUB is the title of a new publication and a most creditable one it is. Nos. 1 & 2 are before us and contain among botanical articles, "The Dissemination of plants," by Miss Edna M. Porter, and "Adventives in East Buffalo," by J. F. Cowell. The "Botanical Notes" are mostly written by David F. Day, and of course are very interesting. We wish the new club every success.

AN INVITATION couched in graceful terms and written in the French language has been extended by the Imperial Society of Horticulture of St. Petersburg to all botanists, to attend an international Congress of Botanists and Horticulturists in that city upon the 5th (17th) of May. We learn from the circular that the official language of the congress will be French, but any one is free to express himself in his national tongue. The papers will be limited to 30 minutes. The distinguished committee who issue the call offer to facilitate the journey of every botanist by advice; and to make his stay in the capital agreeable. It is to be hoped that the United States will be represented.

CURRENT LITERATURE.

The Bacteria. By T. J. Burrill, Ph. D. From the eleventh report of the Illinois Industrial University. 8 vo. 65 pp., Springfield, 1882. —No subject connected with botany now commands more general interest, while requiring the highest technical knowledge and skill, than that of the bacteria. The present brochure of sixty-five closely packed pages is a timely contribution. It is specially to be commended as an entertaining and concise *resume* of the subject, both for the general reader only interested to know what bacteria are and how they affect domestic and commercial matters, and for the specialist who wishes the latest information. Dr. Sternberg's translation of Magnin's work is the only other treatise of the kind in the English language. The low price at which the present equally valuable work is issued (50 cts.) ought to ensure a wide perusal. The more serviceable part for the possessor of a good microscope is the systematic portion, filling half the pamphlet. This consists of keys to the genera, and descriptions of genera and species, with notes and synonomy. It is largely a conscientious translation of that part of the first number of Winter's edition of Rabenhorst's *Kryptogamen-Flora von Deutschland, Oesterreich, und der Schweiz* pertaining to bacteria (*Schizomycetes*) and to the closely related yeast plants (*Saccharomycetes*). This brings the most valuable classification with descriptions yet published within the reach of those unfamiliar with the German language. The author interpolates in brackets quite a number of doubtful or unsettled species mostly by Hallier, descriptions of three new species, and names for the species causing hog cholera and chicken cholera.

The Colors of Flowers, as Illustrated by the British Flora; by Grant Allen. (Nature Series, Macmillan & Co., London.)—

This little book deserves well its place in the popular "Nature Series" for it presents a theory in explanation of the coloring of flowers, which seems at first reading extremely plausible *a priori* and apparently so well borne out by the facts that one is almost tempted to accept it without examining closely the foundations on which it rests or the facts to which it appeals for support. The author's first task is to prove that, contrary to the commonly accepted doctrine of morphology, "petals are in all probability enlarged and flattened stamens, which have been set apart for the special work of attracting insects." As a corollary of this proposition it is stated that "as the stamens of almost all flowers * * * are yellow, it would seem naturally to follow that the earliest petals would be yellow too," and as "the earliest and simplest types of existing flowers are almost always yellow, seldom white and never blue, this in itself would be sufficient ground for believing that yellow was the orig-

inal color of all petals." The proofs relied upon by Professor Allen to sustain this position are chiefly three. First: the earliest flowers, i. e., those of the Gymnosperms, consisted only of naked ovules and clusters of stamens. Inasmuch therefore as sepals and petals are a later development than stamens and carpels, they cannot be said to show a transition between green leaves and the latter, as held by the Wolfian hypothesis. Second: stamens show a tendency to become petaloid, as shown by such flowers as *Nymphæa*, the *Mesembryanthemums*, orchids and others. Third: the occasional reversion of petals to stamens as in *Monarda* and *Capsella*.

Assuming the truth of the proposition that the original petals were yellow, the second and largest part of the book is devoted to showing the successive stages in the color-development of flowers, viz: (1) yellow, (2) white, (3) red or purple, (4) lilac, mauve, violet or blue. Examples from many families are adduced to show that the most specialized flowers of a single color are blue and the the least so are yellow. Variegated flowers are still more highly developed, the ground-color being usually some one of the higher series while the spots or lines are of one or more of the lower colors. The occurrence of yellow or white petals in conjunction with a high degree of specialization in other organs is accounted for by retrogression. "Flowers which have reached a given stage in the progressive scale of coloration often show a tendency to fall back to a lower stage." Green flowers (except in Gymnosperms) are explained to be the degenerate descendants of more gaily colored ancestors. Anemophilous green Angiosperms must therefore be considered as the development of flowers.

I have said that Professor Allen's hypothesis was plausible. It is more. Because of the pleasant style of the writer and the easy explanation he offers of those facts which he cites, it is fairly enticing. But there are some things in flower coloration and teratology "hard to be understood" on this theory. Some of Professor Allen's arguments if closely scrutinized, bear in themselves marks of weakness and others are so strained that they have almost passed their "elastic limit." It is hard to believe that amentaceous trees which appeared in the Cretaceous were a later development than the *Magnolia*, *Liriodendron* and Maple, with which, as far as Paleontology shows, they were contemporaneous. Further, if the *Gramineæ* and *Cyperaceæ* are degenerate descendants of some petaliferous liliaceous plant, it is strange that no traces of these ancestral forms were preserved, whereas in the upper Eocene beds are found fossil species of *Arundo*, *Carex*, *Cyperus* and *Poacites*. The objection that such ancestral forms as Professor Allen's theory needs did not grow in places where they would likely be preserved cannot be urged because the *Alismaceæ* (some form of which he thinks was the primordial lily) affect the same stations as the *Cyperaceæ*.

The fact that stamens tend to become petaloid, instead of helping the hypothesis that petals are flattened stamens seems rather to militate against it. That there is a constant tendency to reversion no one who believes in the doctrines of morphology will deny. It is certainly more reasonable to suppose that stamens are reverting to an ancestral form when they become petaloid, as they do in numberless instances, than to suppose that petals are reverting when in a *very few* cases they become antheriferous.

Again, upon the theory advanced how can the origin of sepals be accounted for? Were the primal sepals yellow or blue? or have they *degenerated* to a green color? Can anyone believe that when sepals and bracts become petaloid they are reverting to an *older* form.

While we cannot accept as reasonable the theory advanced for the

reasons stated above and because we doubt very much whether the facts if fully known would bear out some of the fundamental statements of the author, yet the book before us is certainly a most entertaining contribution to evolutionary botany and well worth a careful reading. (For additional criticism, see Dr. A. Gray, in Am. Jour. Sci., Mar., p. 236.)

ARTICLES IN JOURNALS.

ASCHERSON, P.—Review of C. and W. Barbey's "Botanizing in the Levant," *Bot. Zeit* Feb. 16; Review of the 5th volume of Boissier's "Flora Orientalis," l. c. Mar. 9.

ASKENASSY.—Review or Berthold's "Distribution of Algæ in the Gulf of Nepaul, etc., *Bot. Zeit.* Feb. 16.

BAKER, J. G.—A Synopsis of the genus Selaginella (containing descriptions of 8 new species), continued, *Jour. Bot.* 21. p. 80.

BEAL, W. J.—The movements of Roots of Indian Corn in Germination, *Am. Nat.* 17. 4. p. 412

BENNETT, ARTHUR.—Two new Potamogetons (with plate), *Jour. Bot.* 21. p. 65.

BRITTEN, JAMES.—A review of Sir J. D. Hooker's "Flora of British India," part 9, *Jour. Bot* 21. p. 88.

BUCHENAU, FR.—Review of "Alex Braun's Life as drawn from his writings," by G. Reimer, *Bot. Zeit.* Mar. 16.

CHEESEMAN, E. L.—An Alga in an Aquarium (with note by the editor), *Am. Mo. Mic. Jour.* 4. p. 41.

COOKE, M. C.—On Sphærella and its allies, *Jour. Bot.* 21. p. 67.

EATON, D. C.—New or little-known Ferns of the U. S. No. 13. (in which is a description of a new Notholæna from California.) *Torr. Bull.* 10. 3. p. 26.

FARLOW, W. G.—Notice of Rabenhorst's Kryptogamen-Flora, vol. II, parts 1-3, *Am. Jour. Sci.* 3. 25. p. 314; Notice of C. B. Plowright's "Heteroecism of Uredines." l. c.

FAYOD, V.—Contributions to the knowledge of the lower Myxomycetes, 1 Plate, *Bot. Zeit.* Mar 16.

FOX HOWARD.—Influence of Environment on Plants (Brief note on flowering of Acacia dealbata), *Nature*, 27. p. 315.

GEYLER.—Notice of A. Schenk's paper upon Medulosa elegans, *Bot. Zeit.* Feb. 23; notice of J. Felix's paper upon the petrified woods of Frankenberg in Saxony, l. c.; notice of Ferd. v. Mueller's "New Vegetable Fossils of Victoria, l. c. Mar 16.

GOODALE, G. L.—Notice of T.H.W. Englemann on "Color and assimilation," *Am. Jour. Sci.* 3. 25, p. 312; Notice of E. Stahl "on the influence of Sunny and Shaded Localities on the Development of Foliage Leaves," l. c p. 313; Notice of Meehan on "Freezing of liquids in living vegetable tissue," *Science*, 1. 8. Note 507.

GRAY, ASA, and J. H. TRUMBULL.—Review of De Candolle's Origin of Cultivated Plants; with Annotations upon certain American Species, *Am. Jour. Sci.* 3. 25. p. 211.

HITCHCOCK, R.—The Reticulate Structure of Living Matter (an excellent criticism of the "Bioplasson" theory), *Am. Mo. Mic. Jour.* 4. p. 48; Plants in Water at High Temperature. l. c. p. 57.

KALCHBRENNER, C.—Communication on Mycology, *Flora*, Feb. 21.

KOEHNE, E.—Review of DeCandolle's "Origin of Cultivated Plants," *Bot. Zeit.* Mar. 2.

KRAUS, Dr. Carl.—Inquiries upon the sap-pressure in plants, 3d paper, *Flora*, Feb. 21.

KUTSCHER, Emil.—Upon the function of tannic acid in metastasis, concluded, *Flora*, Feb. 11.

MAGNUS, P.—Notice of the report of the work of M. Gayon upon the physiology of Fungi, *Bot. Zeit.* Feb. 23.

MALAN, Edward.—The Common Orchis (O. masculus), with cuts, *Sci. Gossip*, No. 219. p. 52

MERRIFIELD, MRS. MARY P.—Cryptogamic Flora of Germany, Australia and Switzerland *Nature*, 27. p. 385.

MUELLER, H. Review of Grant Allen's "Colors of Flowers as illustrated by the British Flora," *Bot. Zeit* Mar. 16.

MUELLER, DR. J.—Contribution to Lichenology, *Flora*, Feb. 11.

NYLANDER, W.—New European Lichens, *Flora*, Mar 1.

PARRY, C. C.—A new species of Oxytheca, *Torr. Bull.* 10. 2. p. 23.

SCHIMPER, A. F. W.—Upon the Development of chlorophyll grains and coloring bodies *Bot. Zeit.* Feb. 16, continued Feb. 23, March 2, concluded March 9; with plates.

SCRIBNER, F. LAMSON.—A list of Grasses collected by Mr. Pringle in Arizona and California (in which are descriptions of 2 new species, a Diplachne and a Poa), *Torr. Bull.* 10 3 p. 29.

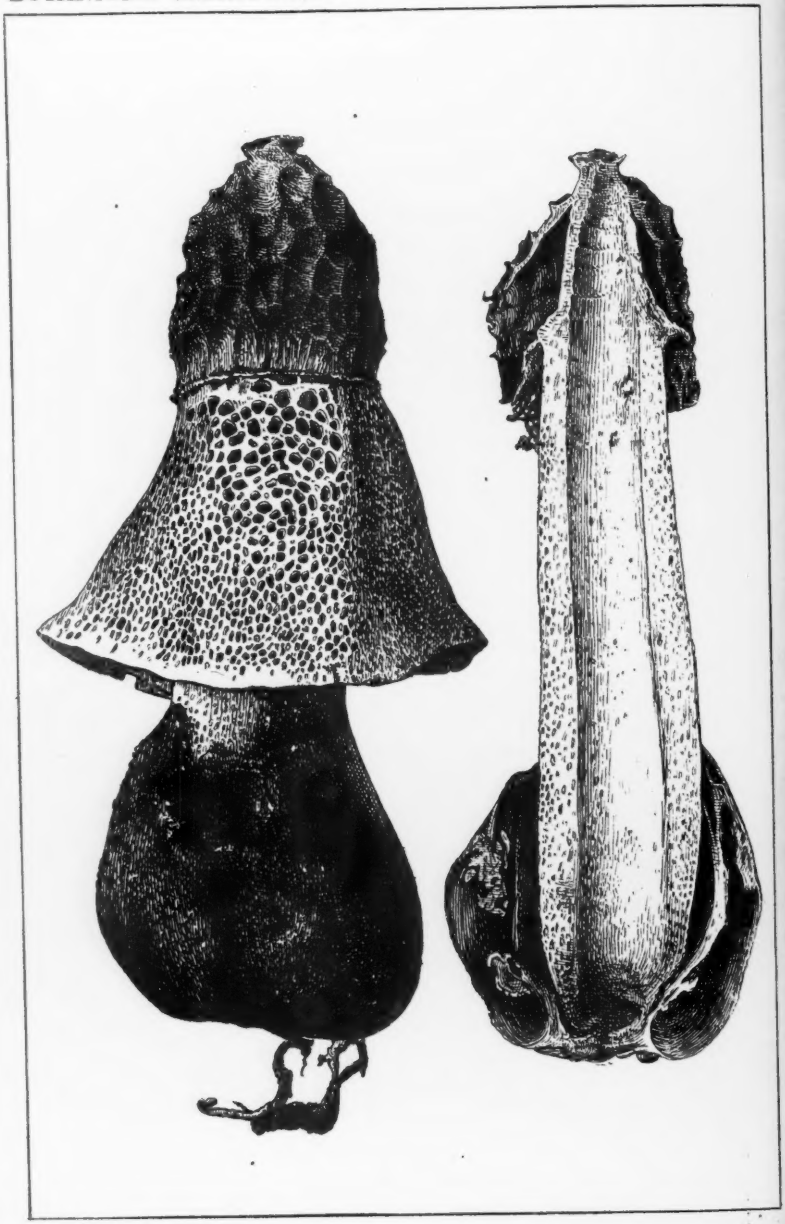
SPENCER, JAMES.—Recreations in Fossil Botany (Lyginodendron Oldhamium), with cuts *Sci. Gossip*. No 219. p. 55.

TRUMBULL, J. H.—See under "GRAY" above.

TUCKERMAN, EDWARD.—New Western Lichens (4 new species and one new genus, Pyrenothamnia by name), *Torr. Bull.* 10. 2. p. 21.

VASEY, GEO.—New Species of Grasses (2 species of Agrostis from the Pacific coast), *Torr Bull.* 10. 2. p. 21; Of three Hybrid Oaks near Washington, D. C (with three plates), l. c. 10. 3 p. 25.

WOLLE, FRANCIS,—Fresh-Water Algæ (with plates), *Torr. Bull.* 10. 2. p. 13.



PHALLUS TOGATUS, KALCHBRENNER